RIVERS AND FLOODS

[River and Flood Division, MERRILL BERNARD in charge]

By BENNETT SWENSON

Report on flood losses suffered during February and March in some of the tributaries of the upper Mississippi River in Iowa and Illinois were received too late for inclusion in the March MONTHLY WEATHER REVIEW and are presented herewith. The damages were caused mainly by the forming and breaking of ice gorges, and summarized according to rivers, are as follows: Des Moines River between Swan and Eldon, Iowa, about $45,000; Rock River in Illinois, $185,000; Maquoketa and Wapsipinicon Rivers in Iowa, $154,000; Galena River in Illinois, $150,000 and 3 lives lost; and in the Iowa and Cedar Rivers in Iowa, $13,300.

The precipitation over the United States during April varied greatly in different areas. The monthly totals were above normal rather generally in the upper Mississippi Valley, the Lake region, the Atlantic and the central and eastern Gulf States, and in the far Northwest. The relatively heaviest amounts fell in the Atlantic States from North Carolina northward to Pennsylvania, and in portions of the far Northwest. On the other hand, a large southwestern area had very little rain and in much of the western plains the amounts were scanty.

St. Lawrence drainage.—A heavy wet snow on the 15th in central Michigan followed by moderately heavy rains during the next 3 days caused rises in the Red Cedar and Grand Rivers. The combined rain and melted snow amounted to about 3 inches of water in this section. The Red Cedar at East Lansing, Mich., reached a crest of 0.9 foot above flood stage on the 18th and lowlands between Lansing and East Lansing were flooded to some extent.

The Grand River did not reach flood stage at Lansing and there was only slight flooding of the lowlands from this river. No damage of consequence was reported from these overflows.

Atlantic slope drainage.—Slight flooding occurred in the Susquehanna River and its tributaries in New York the first week of April due to the melting of the winter snow and ice covering as a result of high temperatures the first few days of the month. The overflow was not severe and no damage of consequence occurred.

Another flood occurred in the lower Susquehanna Basin from the 26th to the 28th as a result of heavy rainfall which occurred on the 26th and 27th and which will be discussed below in connection with the floods to the southward. In the Frankstown Branch flood stage was exceeded by 0.8 foot at Huntingdon, Pa., and in the Juniata River at Newport, Pa., by 2.4 feet. The total damage reported amounted to approximately $250,000.

A disturbance that was first noted over the Southeastern States on the 24th moved northeastward with increasing intensity to North Carolina. Further movement was blocked by an abnormally persistent and stable mass of air which had previously moved southward over the North Atlantic States from the Hudson Bay region. The storm remained practically stationary for 48 hours, with its center near the Virginia-North Carolina border, and continuous rain occurred over the region immediately to the north until finally the disturbance began to lose energy.

The rainfall was excessive in some sections with the area of heaviest precipitation extending approximately from central North Carolina northward into portions of Pennsylvania. The rain began over most of this area on the night of the 24th and did not cease until the evening of the 27th in the northern portions. The period of heaviest rainfall occurred on the 25th and 26th. The greatest 24-hour precipitation recorded was 5.84 inches at Clear Spring, Md., for the 24-hour period ending 6 p.m. of the 26th and 5.12 inches at Riverton, Va., for the 24-hour period ending 8 a.m. of the same date. During the period April 24–27, inclusive, amounts in excess of 7 inches occurred over portions of the James, Rappahannock, and Potomac River Basins, the greatest amount reported during this period was 11.62 inches at Clear Spring, Md. Daily and total amounts of precipitation for a few representative stations in this area are given in table 1.

TABLE 1.—*Daily and total precipitation in inches and hundredths, Apr. 25–28, inclusive, 1937*

	April —				Total
	25	26	27	28	
James River Basin	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*
Afton, Va.	3.40	2.50	0.17		6.07
Charlottesville, Va.[1]	5.10	1.87	.22	0.01	7.20
Columbia, Va.[2]	2.25	4.16	.16	0.27	6.84
Lexington, Va.[2]	2.40	.23	.02	.11	2.76
Lynchburg, Va.	1.18	1.82		.11	3.11
Richmond, Va.	.52	2.18	.03	.26	2.99
Rappahannock River Basin					
Culpeper, Va.[2]	2.75	4.25	.50	.20	7.70
Potomac River Basin					
Bayard, W. Va.[2]	1.03	1.57	.07		2.67
Circleville, W. Va.	.18	2.45	.32	.51	3.46
Clear Spring, Md.[2]	2.05	5.84	1.68	2.05	11.62
Cumberland, Md.	.20	3.33	.25	.52	4.30
Dale Enterprise, Va.[2]	1.78	1.87	.27		3.92
Emmitsburg, Md.[2]	1.87	3.72	.68	1.23	7.50
Hancock, Md.	.08	4.00	1.32	1.07	6.47
Harpers Ferry, W. Va.	.09	3.65	1.08	1.62	6.44
McNeill, W. Va.[2]	1.62	3.02	.29	.13	5.06
Mount Weather, Va.[2]	.78	2.67	.68	1.37	5.50
Piedmont, W. Va.[2]	1.75	2.23	.18	.16	4.32
Riverton, Va.	.41	5.12	.77	.44	6.74
Shenandoah Camp No. 3, Va.	3.56	3.74	.38		7.68
Staunton, Va.	.46	2.83	.12	.33	3.74
Washington, D. C.	.14	2.11	1.54	.56	4.35
Winchester, Va.[2]	1.50	4.43	.12	.64	6.69
Woodstock, Va.	.19	3.15	.45	.45	4.24

[1] Precipitation is for 24-hour period midnight to midnight. 1.00 inch precipitation that occurred during the 24th is not included in the total.
[2] Daily amounts measured in late afternoon.

NOTE.—Except as otherwise indicated daily amounts measured in the morning.

This excessive precipitation caused severe flooding in most of the streams in Virginia and Maryland and in portions of West Virginia and Pennsylvania. Severe flooding occurred in the lower portion of the James River but flood stages were not reached at Lynchburg, Va., and points upstream. The highest stage at Richmond, Va., was only 1.3 feet below the record stage reached in March 1936. The Potomac River Basin suffered its third greatest flood of record, being exceeded only by the record floods of March 1936 and May–June 1889 and was comparable to the flood of May 1924. The Bureau maintains no gages on the Rappahannock River but from reports it appears that the stages on that river were the greatest of record. Fredericksburg, Va., was probably the hardest hit of any of the cities in the flooded area. Table 2 shows stages at a few points in comparison to previous floods.

It is impracticable to give an estimate of flood losses at this time; practically all towns in the flooded areas were inundated to some extent. Roads were damaged, several bridges were washed out, and traffic was delayed considerably, due to the freshet waters. High water along the water-front sections in the tidewater reaches of the rivers

in Virginia, Maryland, and in the Chesapeake Bay region on April 25 and 26, caused by strong easterly winds for an extended period, resulted in considerable damage.

TABLE 2.—*Crest stages for April 1937 compared with a few previous floods*

Station	River	1889	1924	1936	1937
		Feet	*Feet*	*Feet*	*Feet*
Columbia, Va.	James		31.2	35.8	34.4
Richmond, Va.	do	[1] 25.2	20.1	26.5	25.2
Cumberland, Md.	Potomac	29.2	28.4	29.1	24.2
Hancock, Md.	do	39.7	35.0	47.6	35.8
Riverton, Va.	Shenandoah	36.0	34.0	37.5	[2] 27.0
Harpers Ferry, W. Va.	Potomac	36.0	27.6	36.5	29.0
Washington, D. C. (Wisconsin Ave. gage).	do			17.2	14.2

[1] Reading taken on gage ½ mile downstream from present gage.
[2] Approximate. Determined by leveling to high water mark.

Floods, as a result of the passage of the disturbance previously discussed, were less severe south of the Virginia-North Carolina border. Minor floods also occurred in this region the first half of the month. Total losses for the month in this section were as follows: Roanoke River, $35,000; Tar River, $5,000; Neuse River, $6,000; Cape Fear River, $3,000; Peedee River, $16,500; Santee Basin, $6,100; and the Savannah Basin, $2,000.

East Gulf of Mexico Drainage.—The Apalachicola River was at or above flood stage throughout the month but material damage occurred only during the period 8th–19th when a loss of $8,000 was reported.

Heavy to excessive rains in southeastern Alabama on April 4–5 caused moderate floods in the Conecuh, Pea, and Choctawhatchee Rivers. The estimated losses were somewhat in excess of $23,000 for the Conecuh and $12,000 for the Choctawhatchee River while no damage was reported for the Pea River.

Minor flooding occurred in tributaries of the Alabama River and in the Pearl River but no damage of consequence was reported.

Upper Mississippi Basin.—Due to rapid melting of snow and moderately heavy rainfall on the 11th, over the watershed of the Redwood River, a tributary of the Minnesota, a flood occurred in a limited area with the town of Marshall, Minn., as the center. More than 30 homes were isolated when the river crested on the 12th and a property loss of $7,000 was reported.

Stages in the Illinois River began rising near the close of the month, but as the rise continued into May discussion will be deferred until a later issue of the REVIEW.

Missouri Drainage.—Severe flooding attended the spring break-up in the upper Big Sioux River and tributaries as far south as Sioux Falls, S. Dak. From Lincoln County, S. Dak., to the mouth the rise was less pronounced and at Akron, Iowa, where the only official gage on the Big Sioux River is located, the crest reached 12.3 feet, or 0.3 foot above flood stage, on the 14th and again on the 16th. The precipitation over the watershed for the first 3 months of the year was the heaviest since 1929 and additional heavy snow fell again on April 2 and 3. Mild temperatures melted the snow rapidly and by the 10th and 11th the highest stages were reached in the upper tributaries.

The loss to farm crops was not great, due to a crop failure over most of the valley during the 1936 season. The total losses reported amounted to about $90,000 and were confined to the upper reach of the Big Sioux River and tributaries above Sioux Falls, S. Dak.

Ohio Drainage.—Light to moderately heavy rains were frequent over the northern portions of the Ohio River Basin during most of April, maintaining the ground in a well-saturated condition and the streams at or above normal flow. This resulted in flooding or near flooding in most of the northern tributaries of the Ohio River as well as in the upper Ohio River itself.

The flooding was light to moderate in the Scioto River and in the Wabash River system, but no losses of consequence were reported.

More serious flooding occurred in the Allegheny and Monongahela Rivers and tributaries. The flooding in this section was caused by a period of moderately heavy rain from the 21st to 23d and heavy rain on the 25th and 26th following frequent rains during the first 3 weeks of the month. The rainfall averaged 1.85 inches over practically the entire basin above Pittsburgh, Pa., for the afternoon and night of the 25th and at Somerset, Pa., 3.62 inches was recorded for the 24 hours ending the morning of the 26th.

A crest stage of 35.1 feet, or 10.1 feet above flood stage, was reached at Pittsburgh, Pa., on the 27th. This rise resulted in flooding in the Ohio River as far downstream as Point Pleasant, W. Va. Because of timely warnings the damage throughout this area was small, considering the high stages reached at some points. The greatest losses were the suspension of business and the cost of cleaning up after the flood. Statistics on the actual figures are not available at this time. No material losses occurred below Wheeling, W. Va.

Arkansas, Red, and Lower Mississippi River Drainage.—Minor flooding occurred in the Poteau, Sulphur, and St. Francis Rivers during the month, but no damage of consequence resulted.

West Gulf of Mexico Drainage.—Rapid melting of the heavy snow cover on the upper watershed of the Rio Grande resulted in flooding in the vicinity of Espanola and Albuquerque, N. Mex., on April 17 and April 20. The river overflowed the banks at San Marcial, N. Mex., and covered 2,500 acres of rich irrigated farming land with 3 feet of water. The damage resulting from this overflow has been estimated at $50,000.

Columbia River Drainage.—Light rains began over the Willamette Basin the latter part of March and continued almost daily for the first 11 days of April. These rains were followed by heavy rains from the 12th to the 14th over the entire Willamette watershed, accompanied by mild temperatures, resulting in rapid melting of snow in the Cascades. These factors caused the highest April flood of record in the Willamette.

The 4-day total rainfall, April 12–15, inclusive, for stations in the Willamette Basin is given in the following table:

Station	Total rainfall	Station	Total rainfall
	Inches		*Inches*
Albany, Oreg.	4.21	Rujada, Oreg.	4.42
Cascade Summit, Oreg.	4.76	Saginaw, Oreg.	4.04
Detroit, Oreg.	6.23	Salem, Oreg.	4.02
Eugene, Oreg.	3.38	Spring Glade Acres, Oreg.	4.57
Eula, Oreg.	4.43	Summit, Oreg.	4.65
Intake, Oreg.	4.76	Three Links, Oreg.	5.49
Jefferson, Oreg.	4.06	Timber, Oreg.	5.53
Leaburg, Oreg.	4.51	Waterloo, Oreg.	4.26
Mehama, Oreg.	5.43	Willamina, Oreg.	4.62
Portland, Oreg.	3.60		

Average for 19 stations, 4.58 inches.

The total losses, based on a careful study made by the United States Engineer Office, are estimated to be about $600,000. This estimate includes such items as erosion and the delay and rerouting of traffic.

Table of flood stages during April 1937

[All dates in April unless otherwise specified]

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
ST. LAWRENCE DRAINAGE					
Lake Michigan					
Red Cedar: East Lansing, Mich.	Feet 8	18	19	Feet 8.9	18
ATLANTIC SLOPE DRAINAGE					
Connecticut: South Newbury, Vt.	18	29	(1)	20.3	30
Tioughnioga: Whitney Point, N. Y.	12	6	8	14.7	7
Chenango: Sherburne, N. Y.	8	6	8	9.3	6
Frankstown Branch: Huntingdon, Pa.	12	26	28	12.8	27
Juniata: Newport, Pa.	22	27	28	24.4	27
Susquehanna:					
Oneonta, N. Y.	12	6	7	13.0	6, 7
Bainbridge, N. Y.	12	7	7	12.1	7
North Branch of Potomac: Cumberland, Md.	17	26	27	24.2	26
Shenandoah: Riverton, Va.	22	26	27	[2] 27.0	27
Potomac:					
Hancock, Md.	32	26	27	35.8	27
Harpers Ferry, W. Va.	18	26	29	29.0	27
Sycamore Island, Md.	10	26	30	23.7	28
Washington, D. C.	8	27	29	14.2	28
James:					
Columbia, Va.	10	25	(1)	34.4	26
Richmond, Va.	8	25	29	25.2	27
Dan: Clarksville, Va.	13	27	27	13.6	27
Roanoke:					
Randolph, Va.	21	26	28	25.8	27
Weldon, N. C.	31	26	30	42.1	28
Williamston, N. C.	10	29	(1)	13.0	May 2, 3
Fishing Creek: Enfield, N. C.	14	27	29	14.8	28
Tar:					
Rocky Mount, N. C.	8	6	6	9.1	6
		26	(1)	9.9	30
Tarboro, N. C.	18	28	(1)	22.7	May 1
Greenville, N. C.	13	10	13	13.9	12
		28	(1)	16.9	May 3
Little: Kenly, N. C.	8	6	10	14.0	6
		26	27	12.2	26
Neuse:					
Neuse, N. C.	14	7	9	17.2	9
		26	(1)	17.5	28
Smithfield, N. C.	18	7	11	15.6	10
		26	(1)	17.5	28
Goldsboro, N. C.	14	8	15	16.8	11
		27	(1)	18.4	May 3
Kinston, N. C.	14	11	17	15.3	14
		29	(1)	16.3	May 6
Haw: Moncure, N. C.	20	26	26	21.0	26
Cape Fear: Lock No. 2, Elizabethtown, N. C.	20	7	9	21.8	8
		27	(1)	27.0	28
Peedee:					
Cheraw, S. C.	30	26	28	34.0	27
Mars Bluff Bridge, S. C.	17	11	13	17.5	12
		27	May 5	20.1	May 1
Saluda:					
Pelzer, S. C.	6	24	26	7.0	25
Chappells, S. C.	15	25	27	17.3	27
Broad: Blairs, S. C.	14	25	27	17.3	26
Catawba: Catawba, S. C.	11	26	26	11.4	26
Wateree: Camden, S. C.	23	26	27	24.7	26
Santee:					
Rimini, S. C.	12	[3]	(1) [4]	12.7	2
				15.0	12
				16.4	30
Ferguson, S. C.	12	[3]	(1)	13.7	13, 30
Savannah:					
Ellenton, S. C.	14	6	20	19.0	12
		25	(1)	21.3	May 3
Clyo, Ga.	13	14	22	15.0	17
Ocmulgee:					
Macon, Ga.	18	30	(1)	------	------
Abbeville, Ga.	11	15	16	11.3	16
Oconee: Milledgeville, Ga.	22	30	(1)	------	------
Altamaha: Charlotte, Ga.	12	[3]	4	------	------
		8	22	13.6	14, 15
EAST GULF OF MEXICO DRAINAGE					
Apalachicola: Blountstown, Fla.	15	[3]	(1)	------	------
Pea: Elba, Ala.	30	6	6	30.0	6
Choctawhatchee:					
Newton, Ala.	19	6	7	22.6	7
Geneva, Ala.	23	7	11	26.4	8
Caryville, Fla.	12	8	14	14.1	10
Conecuh:					
River Falls, Ala.	35	5	10	42.0	6
Brewton, Ala.	17	7	13	19.6	10
Etowah: Canton, Ga.	17	30	30	17.5	30

See footnotes at end of table.

Table of flood stages during April 1937—Continued

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
EAST GULF OF MEXICO DRAINAGE—contd.					
Coosa:	Feet			Feet	
Gadsden, Ala.	20	30	(1)	20.9	30
Lock No. 4, Lincoln, Ala.	17	30	(1)	18.4	30
Pearl:					
Jackson, Miss.	18	8	13	19.4	10
Pearl River, La.	12	[3]	4	------	------
		8	15	13.6	11
MISSISSIPPI SYSTEM					
Upper Mississippi Basin					
Illinois:					
Peru, Ill.	17	23	[1 5]	17.7	28
Peoria, Ill.	18	27	(1)	------	------
Havana, Ill.	14	21	(1)	------	------
Beardstown, Ill.	14	27	(1)	------	------
Missouri Basin					
Big Sioux: Akron, Iowa	12	14	17	12.3	14, 16
Ohio Basin					
Stony Creek: Johnstown, Pa.	15	26	26	17.5	26
Kiskiminetas: Saltsburg, Pa.	16	26	26	16.1	26
Allegheny:					
Lock No. 8, near Mosgrove, Pa.	24	26	30	28.3	26, 27
Lock No. 5, Schenley, Pa.	24	26	30	34.2	26, 27
Lock No. 4, Natrona, Pa.	24	26	29	31.5	27
Lock No. 3, Acmetonia, Pa.	25	26	29	32.8	27
Youghiogheny:					
Confluence, Pa.	13	26	26	15.0	26
Connelsville, Pa.	13	26	26	15.8	26
West Newton, Pa.	20	26	26	20.6	26
Monongahela:					
Lock No. 7, Greensboro, Pa.	30	26	27	33.1	26
Lock No. 4, Charleroi, Pa.	30	26	27	32.8	27
Muskingum: Lock No. 1, Marietta, Ohio:					
Upper Gage	28	28	30	32.0	29
Lower Gage	35	28	30	40.0	29
Scioto: La Rue, Ohio	11	26	26	11.1	26
West Fork of White:					
Anderson, Ind.	8	[3]	[1 5]	10.8	6
Elliston, Ind.	18	7	10	19.6	9
Edwardsport, Ind.	12	7	14	17.0	11
		16	18	12.9	17
		23	27	15.0	25
		29	(1)	------	------
Wabash:					
La Fayette, Ind.	11	5	10	16.8	7
		23	(1)	15.7	29
Covington, Ind.	16	6	11	20.3	9
		24	(1)	19.0	30
Terre Haute, Ind.	14	6	13	16.3	11
		24	(1)	15.2	27, 28
Ohio:					
Pittsburgh, Pa.	25	26	29	35.1	27
Old Dam No. 2, Coraopolis, Pa.	26	26	28	32.5	27
Dam No. 7, Midland, Pa.	30	26	29	44.4	27
Dam No. 12, near Wheeling, W. Va.	36	27	29	45.9	28
Dam No. 13, near Wheeling, W. Va.	45	27	29	48.8	28
Parkersburg, W. Va.	36	28	30	39.2	29
Dam No. 19, Little Hocking, Ohio	40	28	30	41.9	29
Dam No. 25, near Addison, Ohio	43	29	(1)	45.7	30
Point Pleasant, W. Va.	40	29	(1)	41.7	30
Arkansas Basin					
Poteau: Poteau, Okla.	21	22	23	22.6	23
Red Basin					
Black: Jonesville, La.	50	[3]	7	------	------
Sulphur:					
Ringo Crossing, Tex.	20	4	5	21.6	4
		21	[7] 24	23.9	22
Naples, Tex.	22	[3]	2	------	------
		24	30	25.4	26, 27
Lower Mississippi Basin					
Big Lake Outlet: Manila, Ark.	10	10	17	10.4	12–14
St. Francis:					
Fisk, Mo.	20	6	8	21.3	8
		25	25	20.0	25
St. Francis, Ark.	18	10	15	18.8	12, 13
Yazoo: Yazoo City, Miss.	29	[3]	5	------	------
Atchafalaya Basin					
Atchafalaya: Atchafalaya, La.	22	[3]	7	------	------

Table of flood stages during April 1937—Continued

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
WEST GULF OF MEXICO DRAINAGE					
Rio Grande:	*Feet*			*Feet*	
Espanola, N. Mex.	7	13	(1)	7.8	17
Albuquerque, N. Mex.	4	16	17	5.0	17
GULF OF CALIFORNIA DRAINAGE					
Colorado Basin					
San Juan: Farmington, N. Mex.	7	16	17	8.0	16
PACIFIC SLOPE DRAINGE					
Columbia Basin					
Middle Fork: Eula, Oreg.	13	14	14	13.5	14
Coast Fork: Saginaw, Oreg.	9	13	16	11.5	15
McKenzie: Leaburg, Oreg.	12	13	16	15.6	14, 15
Santiam: Jefferson, Oreg.	10	13	16	14.5	15
Willamette:					
Eugene, Oreg.	12	14	16	14.3	15
Harrisburg, Oreg.	10	13	17	15.0	16
Albany, Oreg.	20	15	18	24.6	16
Salem, Oreg.	20	15	18	22.4	16
Oregon City, Oreg.	12	15	19	14.6	18

[1] Continued into May.
[2] Approximate.
[3] Continued from previous month.
[4] Fell 0.7 foot below flood stage on 5th and 0.6 foot below on 20th.
[5] Fell slightly below flood stage on 24th.
[6] Fell slightly below flood stage on 2d, 3d, and 20th.
[7] Fell slightly below flood stage on 23d.

REDETERMINATIONS AND ERRATA—MONTHLY WEATHER REVIEW, APRIL 1936

Page	Data	Published	Should be
146	Table comparing 1936 flood with previous high records:		
	1936 stage at Columbia, Va.	35.9	35.8.
	1936 stage at Hartford, Conn.	37.3	37.6.
	1936 stage at Saltsburg, Pa.	33.1	32.9.
	1936 stage at Dam No. 6, Beaver, Pa.	54.8	55.5.
146	Table of flood stages in March and April 1936:		
	Crest at Bellows Falls, Vt.	24.6	24.7.
	Date of crest at Holyoke, Mass.	Mar. 20	Mar. 19, 20.
	Crest at Springfield, Mass.	38.6	28.6.
	Date of crest at Springfield, Mass.	---do	Mar. 20.
	Crest at Hartford, Conn.	37.3	37.6.
	Crest at Clearfield, Pa.	17.8 [1]	17.5.
	Crest at Renovo, Pa.	29.3	29.4.
	Crest at Williamsport, Pa.	33.7 [1]	33.6.
	Date of crest at Williamsport, Pa.	Mar. 19	Mar. 18.
	Crest at Huntingdon, Pa.	22.0 [1]	22.7.
	Crest at Wilkes-Barre, Pa.	28.9	28.8.
	River for stations at Neuse and Smithfield, N. C.	Omitted	Neuse.
	Date of crest at Cheraw, S. C.	Apr. 3	Apr. 4.
147	Crest at Milstead, Ala.	42.2	42.1.
	Date of crest at Ottumwa, Iowa	Mar. 6	Mar. 5, 6.
	Crest at Saltsburg, Pa.	33.1	32.9.
	Crest at Lock No. 4, Charleroi, Pa.	40.1	40.3.
	Crest at Coshocton, Ohio, on Mar. 1 should be omitted.		
148	Oldtown (near Newport), Tenn. Insert dates above flood stage from Mar. 24 to Mar. 29—crest 11.4, date Mar. 26.		
	Crest at Oldtown (near Newport), Tenn.	12.3	10.9.
	Crest at Dam No. 6, Beaver, Pa.	54.8	55.5.
	Date of crest at Dam No. 48, Henderson, Ky.	Apr. 1	Apr. 1, 2.
	Date of crest at Dam No. 49, Uniontown, Ky.	Apr. 4	Apr. 3, 4.
	Date of crest at Cairo, Ill.	Apr. 16	Apr. 15, 16.
	Date of crest at Memphis, Tenn.	Apr. 22	Apr. 20–22.

WEATHER ON THE ATLANTIC AND PACIFIC OCEANS

[The Marine Division, I. R. TANNEHILL, in charge]

NORTH ATLANTIC OCEAN, APRIL 1937

By H. C. HUNTER

Atmospheric pressure.—Pressure averaged slightly below normal over central and southwestern portions of the North Atlantic and considerably below normal over much of the northern portion. From western Iceland to southern Greenland the average deficiency was about one-fifth of an inch. A moderate excess was found over North Sea waters and near the coast of Europe, and there was an excess likewise near Newfoundland, the Maritime Provinces, and New England.

The distribution of pressure through the month showed considerable irregularity. Among noteworthy features were the marked deficiency at Horta during the first 8 days and the moderate excess prevailing thereafter, and the excesses during the final 10 days near Newfoundland and Nova Scotia and around the British Isles.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure (sea level) at selected stations for the North Atlantic Ocean and its shores, April 1937*

Stations	Average pressure	Departure	Highest	Date	Lowest	Date
	Inches	*Inch*	*Inches*		*Inches*	
Julianehaab, Greenland	29.62	−0.21	30.02	7	28.98	1
Reykjavik, Iceland	29.62	−.18	30.27	24	28.91	1
Lerwick, Shetland Islands	29.85	+.05	30.42	29	29.32	10
Valencia, Ireland	29.81	−.08	30.45	29	29.09	2
Lisbon, Portugal	30.09	+.10	30.36	16	29.80	12
Madeira	30.05	+.04	30.27	14	29.62	23
Horta, Azores	30.11	−.04	30.44	18, 25	29.52	3
Belle Isle, Newfoundland	29.90	+.01	30.36	4	29.02	11
Halifax, Nova Scotia	30.02	+.09	30.58	5	29.26	10
Nantucket	29.98	+.01	30.56	5	29.38	9
Hatteras	30.00	−.01	30.42	13	29.46	9
Bermuda	30.06	−.03	30.38	5	29.52	1
Turks Island	30.01	−.01	30.12	13	29.90	27
Key West	30.00	−.02	30.28	12	29.80	26
New Orleans	29.98	−.02	30.39	12	29.51	4

NOTE.—All data based on a. m. observations only, with departures compiled from best available normals related to time of observation, except Hatteras, Key West, Nantucket, and New Orleans which are 24-hour corrected means.

The extremes of pressure in vessel reports at hand are 30.66 and 28.33 inches. The higher reading was noted on the Belgian motorship *Spidoleine*, during the forenoon of the 17th, near 38° N., 40° W. The lower reading was observed at mid-afternoon of the 3d, on the American steamship *Independence Hall*, when about 700 miles east by south of Cape Race.

Cyclones and gales.—April as a whole had more storm activity than is usual so late in the spring. In last month's issue it was noted that Harbour Island, in the Bahamas, had a violent storm on March 31. This probably was an early phase of the LOW, which, as April began, was central very near Bermuda, whence it moved northeastward, gaining energy, to a point near the tail of the Grand Banks early on the 2d (see chart IX). From this position it took a more eastward course, and was not far to northward of Horta at a late hour on the 3d, with decidedly less force than on the 2d. As the table of gales and storms shows, two eastbound steamships, close to 42° N., 45° W., on the 2d, encountered force-12 winds, their barometers dropping to about 28.5 inches; but, as already mentioned, a west-bound vessel near the 38th meridian noted a still lower reading the following day.

This first storm was unimportant after the 5th, and thereafter till the 12th there was no very marked storm activity except close to the American coast. Here a storm traveled northeastward near the coast line, being decidedly energetic on the 8th and 9th, close to the Middle Atlantic States, and reached the vicinity of Newfoundland the night of the 10th–11th.